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ABSTRACT

This study examined the value of the American College Testing Program (ACT) and secondary school performance as predictors of academic performance in college. Multiple regression was used to establish a prediction equation for grade-point average (GPA) at the end of the first term of the freshman year as the dependent variable and ACT and high school percentile rank as predictor variables. The sample was composed of 100 entering freshmen at a small state university in Mississippi. Subjects were picked at random from an alphabetical listing of the population of 585 entering freshmen in 1980. Records in the University Registrars Office were used to acquire information on the variables being studied. Results showed significant correlations between high school rank and GPA as well as between ACT and GPA. The subtests of the ACT were also significantly related to GPA, but none as highly correlated as the composite ACT. Although the ACT did contribute to the prediction equation, secondary school performance was a better predictor than the ACT composite using first semester freshman GPA as a dependent variable. In view of these findings, changes in the admissions policies for public universities in Mississippi are recommended. (LMO)

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THE COLLEGE ADMISSIONS EQUATION: ACT SCORES VERSUS SECONDARY SCHOOL GRADE PERFORMANCE

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The student population in colleges and universities is changing. Whitla reports that new constituencies are coming into higher education.[1] As evidence he cites the fact that women now represent a majority of students enrolled in colleges, that Asian Americans constitute a large section of the college clientele, and that new students are moving away from the humanities and into the sciences.

Accompanying this change in constituency is a decline in the pool of available students. A study by the Carnegie Foundation for the Advancement of Teaching showed a peak in the total number of high school graduates in 1978 with a decline thereafter.[2] The U.S. Department of Education projects a continued decline in full-time enrollment in institutions of higher education through 1992.[3]

With a changing constituency and a smaller pool of potential students, Whitla[4] points out that colleges and universities are revamping and streamlining the admissions process. The admissions equation is receiving more attention as the higher education community looks for ways to accommodate the new constituencies and address the diminishing pool of students.

Much of the increased attention focuses on standardized test scores. Whitla[5] says "the SAT seems to have risen Phoenix-like from the ashes of its tarnished reputation." He cites the New York Times' use of SAT scores as an "educational health thermometer", President Reagan's announcement that a rise of fifteen points in the SAT is a

national priority, and Proposition 48 by the National Collegiate Athletic Association wherein freshmen must have an SAT of 700 to play varsity sports, as evidence of the current strength of admissions test scores. Enthusiasim, however, for test scores is not universal. Slack and Porter[6] take exception to the validity of the SAT and advocate secondary school performance as the only reasonable measure of academic ability.

The rise in credibility of test scores makes them more visible than ever as appropriate criteria for college admissions. Questions remain, however, regarding their widespread use. Reed[7] states "A kid's average over four years of high school is a better predictor of his success than a four-hour test." Schembechler[8] rejects evidence of correlation between test scores and success in college. Gutekunst[9] describes tests as culturally biased. But Robert Cameron,[10] director of research for the College Board, which sponsors the SAT, disagrees, citing that recent studies validate the test as a good predictor. Crouse,[11] in a review of research on the SAT, corroborates to some degree Cameron's claim, pointing out the findings of the National Longitudinal Study, which, according to Crouse, gives strong support for the SAT as a good predictor of freshman grade point average. He cautions colleges and universities, however, pointing out that regression coefficients for SAT and academic performance are inevitably biased because estimates are not based on a sample of applicants, but rather those who actually attended school. Crouse's conclusion is that there continue to be

valid arguments on both sides, but that current data weighs against the SAT's predictive validity.

The question that emerges is "What should the admissions equation be for colleges and universities?" Does the admissions test score (SAT, ACT) have sufficient predictive validity to mandate its continued use, even in an era of a declining student pool? Is, as Crouse and Reed suggest, high school performance the superior predictor? Can schools who are looking for ways to increase the pool of available students de-emphasize test scores in favor of high school performance and still retain credibility in the admissions process?

PROBLEM

The Mississippi State Department of Education reports that the number of public high school graduates declined 11% from 1978-79 to 1984-85.[12] According to projections by the Academy for Educational Development (AED), this decline will continue into the early 1990's, paralleling projections nationwide by the U.S. Department of Education.[13] Projections by AED indicate full-time equivalent enrollment for public four-year institutions in the state at 37,500 in 1991. Contrasted with the 1984-85 FTE of 43,582, this represents a decline of 14%.

Institutions of higher learning in the State of Mississippi are faced with potentially serious enrollment problems if these projections hold true. Since their funding and growth are predicated largely on the size of the pool of high school graduates, there is every indication that a significant decline will occur. What are the options available to the state?

One avenue of response would be to reexamine the use of admission scores as the sole criteria for admission to the eight state colleges. The Board of Trustees of Institutions of Higher Learning for the State of Mississippi requires a minimum score of 15 on the ACT for admission. Having met this requirement, any student is fully admitted. There is no attempt to review other criteria such as secondary school grades. The question arises as to whether or not the ACT is the best predictor of academic success. How does it compare with secondary school performance as a predictor?

DESCRIPTION OF THE STUDY

This study examined the value of the ACT and secondary school performance as predictors of academic performance in college. Multiple regression was used to establish a prediction equation for grade-point average at the end of the first term of the freshman year as the dependent variable and ACT and high school percentile rank as predictor variables.

SAMPLE

The sample was composed of 100 entering freshmen at a small state university in Mississippi. Subjects were picked at random from an alphabetical listing of the population of 585 entering freshmen in 1980. Every 10th student was selected. This procedure was continued without replacement until 100 subjects were selected. Records in the University Registrar's Office were used to acquire information on the variables being studied.

Table 1 presents descriptive statistics for the sample. All variables in Table 1 are presented in the usual form except that high school rank was converted to a percentile, making scores comparable despite different high school sizes.

Table 1 Descriptive Statistics

Name	Mean	STD. Deviation
High School Rank	63.89	26.42
High School Size	171.65	160.75*
ACT - Composite	18.27	4.40
ACT - English	18.99	4.03
ACT - Mathematics	16.93	6.32
ACT - Social Science	16.66	6.37*
ACT - Natural Science	19.92	4.90
Grade Point Average	2.30	1.05

*NON-NORMAL

After reviewing data on the 100 subjects, eight were eliminated as outliers because of first semester GPAs of less than .50. The rationale for this action was that the GPA of the eight students in question was not associated with the ACT and high school rank variables, but rather a reflection of some type of motivational problem. Further justification comes from the fact that given the admission requirements any student who is admitted has the ability to exceed a .50 GPA.

RESULTS

The ACT subtests and high school size were included in the initial data analysis on the possibility that one or more

of these variables was a better predictor of GPA than either ACT Composite or High School Rank. Table 2 presents a correlation matrix of the relationships among ACT scores, high school rank, and first semester freshman GPA. As indicated there are significant correlations between high school rank and GPA as well as between ACT and GPA. The subtests of the ACT are also significantly related to GPA. None of the subtests, however, is correlated as highly as the composite ACT. Finally, school size was totally unrelated to GPA.

Table 2 Correlation Matrix for High School Rank and ACT on 92 Subjects

	Rank	School Size	ACT	ACT-E	ACT-M	ACT-S	ACT-N	GPA
Rank	1.0000							
School Size	.2473	1.0000						
ACT	.4345	.1400	1.0000					
ACT-E	.4899	.1102	.7651	1.0000				
ACT-M	.4517	.1861	.8246	.5761	1.0000			
ACT-S	.3162	.1343	.8199	.4989	.4923	1.0000		
ACT-N	.1666	.0117	.8312	.5063	.5702	.6612	1.0000	
GPA	.5957	.0756	.4015	.3997	.3922	.2927	.2119	1.000

Critical value of r(2tail,p=.05)=±0.20486

Regression analysis was performed using high school rank and composite ACT as independent variables with first semester GPA as the dependent variable. Other variables were either redundant or unrelated. Table 3 shows that regression is significant ($F=27.271$ with 2,89 df; $p<.001$).

Table 3 Analysis of Variance

Source	Sum of Squares	DF	Mean Square	F Ratio	Probability
Regression	26.75	2	13.3756	27.271	<.001
Residual	43.65	89	.4905		
Total	70.40	91			

Table 4 is a test of regression coefficients. It shows that the regression coefficient for high school rank is significant (t=5.603 with 89 df; p<.001). The t test for the regression coefficient of ACT is not significant (t=1.898 with 89 df; p>.05). The multiple R was .6164, which accounts for 38% of the variance. If R squared is adjusted for shrinkage, it still accounts for 36.6% of the variance.

Table 4 Test of Regression Coefficients

Variable	Regression Coefficient	STD ERROR	T(DF=89)	PROB.	PARTIAL r
Rank	.0177	.0032	5.603	.0000	.28
ACT	.0348	.0183	1.898	.0609	.389

STD ERROR OF EST. = .7003

Adjusted R Squared = .3660
R Squared = .3800
Multiple R = .6164

A prediction equation using ACT and secondary school rank is presented below. As noted earlier, high school rank must be converted to a percentile in the prediction equation.

Predicted first semester GPA = 0.6934 + (.0348)ACT + (.0177)High School Rank

The standard error of estimate was 0.7003.

In our random sample of 92 freshmen, exactly 25% (N=23) had a predicted 1st semester GPA of less than 2.0. Of this group considered "at risk," 39% (N=9) still achieved a 2.0 or higher. One of the group achieved a 3.04 first semester GPA.

DISCUSSION

For this study secondary school performance was a better predictor than ACT composite using first semester freshman GPA as a dependent variable. As shown in Table 4 high school rank was significant as a regression coefficient and ACT was not. However, ACT did contribute to the prediction equation.

This finding does not lend strong support to the often cited justification by testing services that college admissions tests are a significant factor in the prediction equation. Schrader[14] makes this claim on behalf of The College Board of the SAT. Trusheim[15] confirms Schrader's claim after an exhaustive review of data from the National Longitudinal Study (NLS). He points out, however, that while the SAT is a valid predictor, "high school rank is the best single predictor of freshman grades," a finding verified by the NLS and the 1974-78 Validity Study Service Data Base, as well as the present study. The conclusions drawn by Trusheim[16] are that high school rank is a better predictor for grades and completion of a college degree and that the test score (SAT) adds "virtually no additional information that would help the typical college to maximize the percentage of correct admissions decisions."

The focus of this research, however, was not to confirm or refute the validity of standardized test scores as criteria for admission to college. The Board of Trustees of Institutions of Higher Learning for the State of Mississippi has established a minimum of 15 on the ACT composite as the primary criterion for admission to a four-year public university in the state. Secondary school academic performance is not used. This research was designed to see if ACT was a better predictor, as the policy of the Trustees would suggest, or to confirm evidence of researchers such as Trusheim that secondary school performance is superior.

Given evidence in the research literature and the findings of this study, questions must be raised as to the rationale of the State of Mississippi for its admissions policy. The State has many economic and social problems. In response to these problems, education must be seen as a key factor. Educational attainment will drive up earnings and the quality of life for the State's residents. To establish an admissions policy which is indefensible based on research and which excludes rather than includes seems counterproductive to efforts by the State to improve itself.

Two factors emerge as relevant to this research. First, the pool of students available to the colleges and universities is projected to decline into the 1990's. This calls for an admissions policy which is responsive to this decline. The reported average ACT score for the State of Mississippi is

15.6. A 15 ACT minimum approximately reduces the pool of available students by one-half. Without alternative criteria for admission, enrollment declines in the State are a certainty. Further, it should be remembered that even when high school rank is considered with ACT, producing a far more accurate prediction equation, that prediction errors are bound to occur. In our sample, 39% of those with a predicted first semester GPA of below 2.0 actually did exceed a 2.00. Many others were close and went on to graduate.

Second, the State has the lowest per capita income in the nation and the fourth lowest median educational attainment. The appropriate response to these statistics is to increase educational opportunity and access. The 15 ACT minimum does just the opposite, restricting educational access, eliminating students who might be successful. On a more philosophical level, America is recognized as a country where everyone has an opportunity to be successful. This success is predicated, to a large degree, on educational attainment. Why not give potential students the chance to succeed or fail, rather than no opportunity at all.

This research supports secondary school performance as a good predictor of academic success in college. Why can't it be a factor in the admissions policy of the institutions of higher learning in Mississippi? Why limit access to higher education by allowing only the ACT to serve as a criterion for admission? Two alternatives are (1) to replace the ACT with some measure of high school performance, or (2) to

establish an either/or procedure wherein a student can be admitted by an acceptable ACT score or some acceptable level of high school performance. Given the use of standardized tests by external agencies such as the NCAA and the power the tests hold over the academic community, it's not politically realistic to think that the ACT can be replaced. It does seem rational, however, to add secondary school academic performance as a vehicle for gaining eligibility to the State's public universities.

Students who have demonstrated academic proficiency, either through performance on a standardized test or on high school grades, deserve an opportunity to attend the State four-year public universities of their choice. To deny a student with acceptable high school grades the opportunity to attend a four-year college because of a test score is to place too great an emphasis on the predictive value of the tests, an emphasis that this and other research suggests is misplaced.

NOTES

[1]Dean Whitla, "The Admissions Equation," Change, November/December 1984, p. 21.

[2]"Change Trendlines: The Carnegie Foundation for the Advancement of Teaching," Change, November/December 1984, p. 31.

[3]National Center for Education Statistics, The Condition of Education (Washington DC: US Government Printing Office, 1984), p. 81.

[4]Whitla, p. 22.

[5]Ibid., p. 24.

[6]Warner V. Slack and Douglas Porter, "The Scholastic Aptitude Test: A Critical Appraisal," Harvard Educational Review, May 1980, p. 154.

[7]The Clarion Ledger [Jackson, Mississippi], 16 August 1986, p. 5D.

[8]Ibid.

[9]Ibid.

[10]Ibid.

[11]James Crouse, "Does the SAT Help Colleges Make Better Selection Decisions?," Harvard Educational Review, May, 1985, p. 197,200.

[12]Mississippi State Department of Education, Annual Report of the State Superintendent of Public Education (Jackson: State Department of Education, 1986), p. 32.

[13]Academy for Educational Development, Projections of Enrollments for Public Senior Institutions in Mississippi (Washington DC: Academy for Educational Development, 1978), p. 18.

[14]William B. Schrader, "The Predictive Validity of College Board Admissions Tests," in William H. Angoff, ed., The College Board Admissions Testing Program: A Technical Report on Research and Development Activities Relating to the Scholastic Aptitude Tests and Achievement Tests (New York: College Entrance Examination Board, 1971), p. 143.

[15]Dale Trusheim and James Crouse, "The ETS Admissions Formula: Does the SAT Add Useful Information?," Kappan, September 1982, p. 59.

[16]Ibid., p. 61.